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APPLYING TEM MODEL (TEACHING EVALUATION MODEL) IN AN ACADEMIC COURSE IN ACCOUNTING: A COMPARISON ACROSS FIVE YEARS.

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Abstract

The research is focused on the performance analysis of students attending an academic course in accounting across five years. The teacher adopted the new methodology so called TEM (Teaching Evaluation Model). In particular, the Teaching Evaluation Model (TEM) is a "work model" used by the professor whit the aim to continuously improve the academic teaching activity through a continuously valuation process of the students and of the teacher itself. The TEM model represents, in summary, a systemic approach to the teaching activity, based on the Deming Cycle (Plan, Do, Check, Act). The scope of the current research is to test the efficacy of the TEM model applied during an academic course in accounting across different years

Keywords: Teaching Quality, Self–evaluation, Continuous Improvement, Deming Cycle

Introduction

The aim of the work is the constant searching for "quality of education".

In this sense, the Deming Cycle (PDCA), represented the most significant methodological choice. In particular, TEM[35], retraces the cycle Plan, Do, Check, Act of Deming, through a system of schemes of design/ management, didactical evaluation/self-evaluation, aimed at analyzing and improving every single lesson. The teacher after having planned his own educational intervention (Plan) realizes the lesson (Do) and at the end of the same administered to learners an evaluation questionnaire (objective test - Check 1).

The obtained results allow the teacher to identify possible problems, seek the causes which generate them through a self-assessment questionnaire (Check 2) and define the corrective actions to be implemented already in the next lesson (Act). The cycle is repeated in all the lessons of the course offering to the teacher the opportunity to assess the level of learning of each student and the class as a whole (homogeneity - heterogeneity) - acting consequently in order to improve the educational activity. The TEM model, in this sense, allows the teacher to standardize "the good practices" to constantly improve all processes and try the path of innovation, building and maintaining a wealth of formalized experiences which, therefore, can be estimated, compared and improved. The work is divided into multiple phases, the first aspect analyzed concerns the analysis of the international literature, with reference to issues related to the evaluation of the teacher as a function of didactical self-evaluation and in view of the quality of teaching.

[35] Verna I., Il ciclo di Deming nella didattica universitaria Il Teaching Evaluation Model (TEM), Aracne Editrice, Roma, 2012.

After that it is briefly described the TEM model and its main characteristics. The work is focused on the analysis of the results which have been generated, in term of learning, by a teacher in an accounting course using the TEM methodology in four different years. In detail it has been performed a double analysis. The aim of the first one is to compare the results generated by the same professor but in two different years, with and without the usage of the TEM model. The scope of the second analysis is to verify the efficacy of the TEM model across different years. At this scope it have been compared the assessment of the students (intermediate and final exams) across four different years (2010-2013) during which the same professor used the TEM methodology.

Theorical background and supporting literature

The quality of the teaching processes is the result of a constant commitment of the teacher in the analysis of the didactical processes carried out (Shoulders C.D., and Hicks S.A., 2008), in their improvement that begins "by listening" to the learners - of their skills, ability and motivation to learn - and consolidates in the experience gained through the constant pursuit of an effective model of teaching (Angelo and Cross 1993).

The proposed model (TEM) is part of a consolidated context of studies, of northern European tradition (Entwistle and Ramsden 1983; Marton and Salio 1976), revived by Australian researchers (Prosser, Ramsden, Trigwell and Martin 2003) which considers teaching and learning in a close connection (Trigwell and Martin 2003). In particular, the TEM rises as a proposal of a personal "method-tool" , of the teacher (but sharable and comparable among different subjects), useful for the purpose of the reflection, research and improvement of the teaching activities developed and to develop.

The aim of the model is the constant improvement of the quality of teaching through a tool which reduces the gap between the "real model" of teaching applied by each teacher - in the context of place and time in which he shows his professionalism - and the ideal - the most effective – (Pozo-Munoz, Rebelloso-Pacheco and Fernandez-Rammirez 2000) feasible in that precise context.

As noted by some authors (Samuelovicz and Bain 1992; Trigwell et all. 1994), the research effort should be directed to "inform" especially those who teach on the prospects and possibilities of teaching which are feasible.

The international literature is full of studies focusing on the opportunities resulting from a self-rating process of the teacher (Kyriakides and Campell 2004; MacBeath 1999; Nevo 1995; Petegem 2005). Some authors underline the importance of self-evaluation in the process of training and professional growth of the teacher (Airasian and Gullickson 1997; Stronge and Ostrander 1997). For the purposes of self-assessment - in particular about the distinction between self-evaluation carried out according to the experience of the course, then personal and the institutional instead of instead linked to the faculty and to the qualitative change - some authors consider as related the two purposes (Arreola 2000), others see in the first one the premise to the second one (Selding 1999). The TEM model is closer to this latter trend of thought, as noted, in fact, self-evaluation (in the context of the TEM model) represents primarily a personal tool for reflection and research just related to the experience of the course in order to reach the improvement of the quality of teaching (Kane, Sandrotto and Heath 2004).

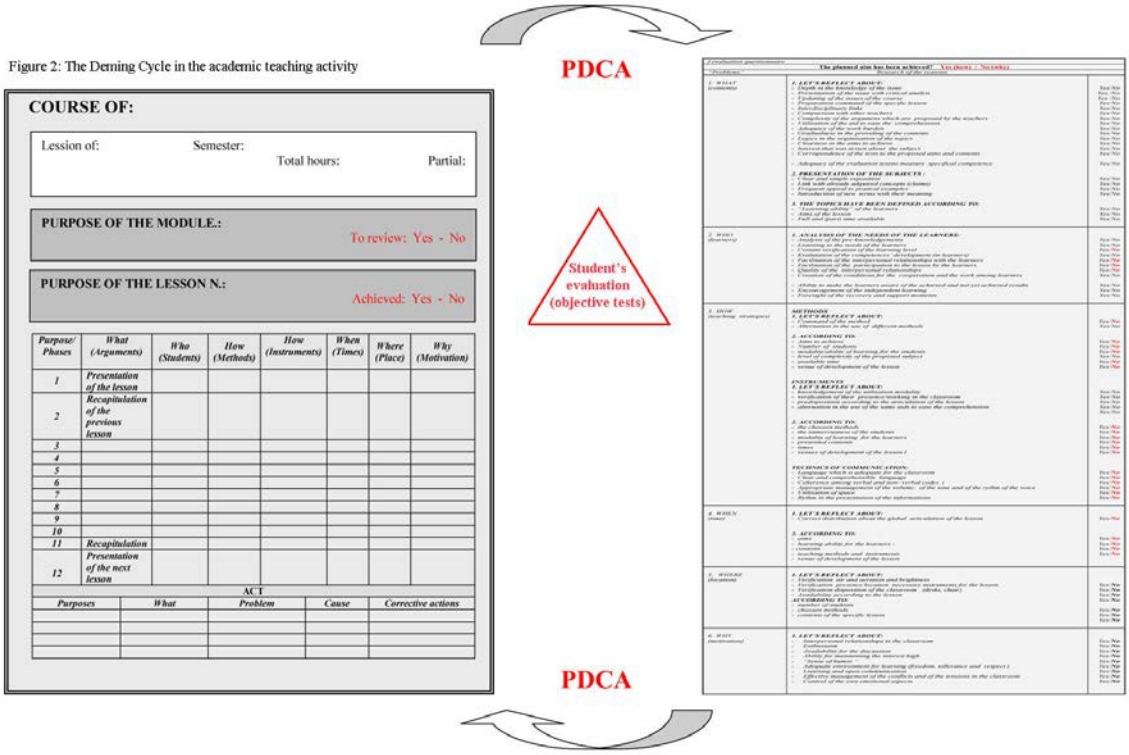
It has to be noted, at the same time, the usefulness of the achieved results also for institutional purposes, as a promoter of qualitative change in universities. In this sense, the Australian universities show a great deal of attention to the issue of teaching evaluation, as the attention to the students and their learning, so to their full satisfaction, coincides with the concept of evaluation itself. It should be noted in particular how, the evaluation processes of teaching based on learners, are accompanied by subsequent self- evaluation processes of the teacher, created primarily through the use of the teaching portfolio.

Even in the Asian context, in the American and the Canadian, the attention on learning generated in learners, hence on the quality of teaching is in the foreground. In particular, innovation, in teaching and in learning processes, is promoted and incentive procedures are claimed to do so. A nearly identical situation for Europe (Great Britain in particular) which focuses on the dissemination of those successful practices (good practices) in teaching in order to raise the quality level of the education offer in the universities. Thus although if it is reached a broad discussion on the topic of self- evaluation (Lyhns 1998; Selding 1999; Zubizarreta 1999), very limited appears instead the international literature on the evaluation of the teacher on the basis of didactical self- evaluation and in view of teaching quality. The TEM model is placed in this particular area of research. Far from being an exhaustive and unlimited answer, the proposed model offers to the teacher the chance to observe and evaluate his own learning path through the lens of quality with a view to continuous improvement.

Il modello TEM

Il modello TEM è rappresentato in forma sintetica nella figura n.1.

Fig.n.1 "The TEM model" [36]



Quality, as suggested by Rolls Royce is "an attitude of mind," a choice that implies a profound cultural transformation (Galgano 1996). Choosing quality means embracing a philosophy of action that locates its roots on a systemic approach, dynamic, aimed at constant improvement. In this sense, TEM model gives the teacher the opportunity to "rethink and interpret" the teaching activities at each educational intervention significantly renewing the stock of knowledge and skills that distinguishes each teacher. In this sense, whatever the initial approach of the teacher is in terms of style, method and teaching ability, the taken direction is the same: the continuous improvement of the teaching quality - a teaching model which is "ideal" to the specific context of time and place in which it operates. It is not

[36] Referred to: Verna I., Lucianetti L., Paper accepted at the International Conference ISF, "I*nternational Scientific Forum*, Tirana, Albania, 12-14 December 2013.

therefore important the model or style of teaching prior to the application of TEM model, whatever it is, the main aspect is the way to be crossed through the application of the model in time. If, therefore, the quality can represent a strategic opportunity for education, the Deming Cycle (Plan, Do Check, Act) marks the way to follow in this direction.

The object of the observation, then, is the university course, the unit of analysis is the lesson in the classroom. The subjects which are involved in the improvement process are both teachers and learners. In particular, the teacher, central character of the process of learners' assessment and self-assessment, is the "beating heart" of the TEM model. It is recognized, summarizing, the key role played by the teacher in the didactical process and it is believed that the experience and the competence which characterize him can represent a privileged "point of view" of the (didactical) reality in its evolution. In this sense, TEM model offers the opportunity to the teacher of "an acting" which tends to the effectiveness of each educational intervention - in terms of "the ability to identify the real needs of the customer" - and the efficiency of the taken actions – as constant improvement of the implemented processes. The learner is the "center" around which the Deming Cycle (TEM model) is developed, because his skills, abilities, motivations to learn are the ones which represent the horizon of them improvement. It is on this basis that it was decided to develop a model that could serve as an incentive and motivation to the continuous improvement not only of the university teaching as "a result of a process", but of the process itself, therefore, of the growth and of the personal and professional development of the individual (teacher-student). TEM model consists of a system of schemes of design, management, evaluation, self-evaluation that produces, over time, the PDCA cycle. Figure n. 1 represents a synthesis of the process described below.

The TEM model allows the teacher to plan his own educational intervention, the implementation of what was planned, the evaluation, in terms of learning generated from the produced results and the address of the next lesson toward to overcoming of the detected problems (improvement, innovation). The planning phase is one in which the teacher sets - with constant reference to the learning characters of the learners - the aims of each intervention and the more appropriate teaching strategies. The scheme presents three main sections: the just mentioned one, that is, related then to the definition of the aims, a second one, which is divided in stages, the presentation of the lesson and the last one that repeats the second part of the scheme, in terms of reviewing and correction of the performed actions (Stage Act), which is analyzed later in the discussion. The same aims will be a key reference in the phase Check 1 in order to verify the learning level of the learners. The reference to the hierarchy of objectives of Bloom allows an easy verification of the purposes of the lesson in the verification tests which are administered at the end of the teaching intervention. The result of the test will allow to define the achievement of objectives themselves and the terms of the design of the next lesson. The second section of the design scheme shows the articulation of the aims of the lesson related to: arguments (what), time (when), methods and tools (how), learning motivation (why) venue of performance of the lesson (where) and especially to the learners (generated level of learning) - (Who).

The next step (Do), is expressed during the lesson in the classroom according to the design scheme. Although the design phase is a basic moment for the effectiveness of the teaching intervention, the implementation timing is not strictly bound to a default scheme. The reference must always be the learner and his "reactions", in terms of learning, to the stimulations of the teacher. The planning scheme represents a general reference, "a pattern guide" made up for "the satisfaction of the needs of the customer" through "the best combination of actual variables. The feedback that the teacher receives from every educational intervention allows him to review already in the meantime (though not in a general way) the impact of the chosen teaching strategies choices and to adopt the required modifications to the general scheme if necessary. The next evaluation stage (check) will

complete the reference framework of the teacher in terms of generated learning. At this point the teacher can evaluate the global results of the teaching activity which has been just delivered, identify the encountered problems and activate the most appropriate actions in order to overcome these problems (improvement).

The heart of the model is constituted by the phase Check. In each educational intervention, the teacher performs the Check phase (1) through objective tests which allow the identification of possible "problems" related to the process of teaching- learning. In particular, at the end of every teaching intervention, the teacher administered a questionnaire to the students (objective tests) of a few items based on the general and partial purposes which are defined in the design scheme. The aim is to assess the learning level that is generated in the learners individually and as a whole (total number of students). This phase, Check 1, gives the startup to the next research activity about the causes of any emerged "problems" (Check 2). In particular, the collected information (as the results which are derived from the evaluation of learners), offers the teacher the opportunity to "reflect" about the achieved results, through the aid of a self-rating questionnaire (Picture n. 2).

This latter directs the teacher in identifying the causes of the possible "problems" which are identified in the assessment phase and in the definition of corrective actions to be implemented.

Fig. n. 2 Self-evaluation questionnaire[37]

Self-evaluation questionnaire		
The planned aim has been achieved? Yes (how) / No (why)		
"Problems"	Research of the reasons	
WHAT (contents)	1. LET'S REFLECT ABOUT:	
	Depth in the knowledge of the issue	Yes/No
	Presentation of the issue with critical analysis	Yes /No
	Updating of the issues of the course	Yes /No
	Preparation command of the specific lesson	Yes/No
	Interdisciplinary links	Yes/No
	Comparison with other teachers	Yes/No
	Complexity of the argument which are proposed by the teachers	Yes/No
	Utilization of the aid to ease the comprehension	Yes/No
	Adequacy of the work burden	Yes/No
	Gradualness in the providing of the contents	Yes/No
	Logics in the organization of the topics	Yes/No
	Clearness in the aims to achieve	Yes/No
	Interest that was arisen about the subject	Yes/No
	Correspondence of the tests to the proposed aims and contents	Yes/No
	Adequacy of the evaluation tests to measure specific competence	Yes/No
	2. PRESENTATION OF THE SUBJECTS :	
	Clear and simple exposition	Yes/No
	Link with already acquired concepts (claims)	Yes/No
	Frequent appeal to practical examples	Yes/No
	Introduction of new terms with their meaning	Yes/No
	3. THE TOPICS HAVE BEEN DEFINED ACCORDING TO:	
	"Learning ability" of the learners	Yes/No
	Aims of the lesson	Yes/No
	Full and (part) time available	Yes/No

[37] Referred to: Verna I., Lucianetti L., Paper accepted at the International Conference ISF, "I*nternational Scientific Forum*, Tirana, Albania, 12-14 December 2013.

WHO (learners)	1. ANALYSIS OF THE NEEDS OF THE LEARNERS: Analysis of the pre-knowledge Listening to the needs of the learners Constant verification of the learning level Evaluation of the competences' development (in learners) Facilitation of the interpersonal relationships with the learners Facilitation of the participation to the lesson by the learners Quality of the interpersonal relationships Creation of the conditions for the cooperation and the work among learners Ability to make the learners aware of the achieved and not yet achieved results Encouragement of the independent learning Foresight of the recovery and support moments	 Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No
HOW (teaching strategies)	METHODS 1. LET'S REFLECT ABOUT: Command of the method Alternation in the use of different methods 2. ACCORDING TO: Aims to achieve Number of students modality/ability of learning for the students level of complexity of the proposed subject available time venue of development of the lesson INSTRUMENTS 1. LET´S REFLECT ABOUT: knowledge of the utilization modality verification of their presence/working in the classroom predisposition according to the articulation of the lesson alternation in the use of the same aids to ease the comprehension 2. ACCORDING TO: the chosen methods the numerousness of the students modality of learning for the learners presented contents times venues of development of the lesson l TECHNICS OF COMMUNICATION: - Language which is adequate for the classroom - Clear and comprehensible language - Coherence among verbal and non- verbal codes t - Appropriate management of the volume, of the tone and of the rhythm of the voice - Utilization of space - Rhythm in the presentation of the information	 Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No
WHEN	1. LET´S REFLECT ABOUT:	

(time)	- Correct distribution about the global articulation of the lesson	Yes/No
	2. ACCORDING TO:	
	- aims	Yes/No
	- learning ability for the learners -	Yes/No
	- contents	Yes/No
	- teaching methods and instruments	Yes/No
	- venue of development of the lesson	
WHERE (location)	1. LET´S REFLECT ABOUT:	
	- Verification air and aeration and brightness	
	- Verification presence/location necessary instruments for the lesson	Yes/No
	- Verification disposition of the classroom (desks, chair)	Yes/No
	- Availability according to the lesson	Yes/No
	ACCORDING TO:	Yes/No
	- number of students	
	- chosen methods	Yes/No
	- contents of the specific lesson	Yes/No
		Yes/No
WHY (motivation)	1. LET´S REFLECT ABOUT:	
	- Interpersonal relationships in the classroom	Yes/No
	- Enthusiasm	Yes/No
	- Availability for the discussion	Yes/No
	- Ability for maintaining the interest high	Yes/No
	- "Sense of humour "	Yes/No
	- Adequate environment for learning (freedom, tolerance and respect)	Yes/No
	- Listening and open communication	Yes/No
	- Effective management of the conflicts and of the tensions in the classroom	Yes/No
	- Control of the own emotional aspects	Yes/No

The self-assessment questionnaire is structured on the basis of the mentioned studies, but it is "modeled" on the experience that is gained by the single teachers, through the constant use of the time instrument, in their context - and by the comparison with the colleagues. Ultimately, it is a tool that fits the reference context according to the results which are achieved by the teachers, in terms of the learning level that is generated among the learners. It is tool that stimulates the personal and collegial research for always increasing professional levels.

In the international literature the usage of reflective and self-evaluating approaches with the aim to enhance the quality of the academic teaching activity is even more expected[38].

Various researchers have examined this issue, some of them by offering some references which have to be considered by the teacher in the process of self-evaluation (Heywood 2000; Kremer-Hayon 1993; Selding 1999). The questionnaire suggested in the TEM model, differs from the others mainly due to the contextual and dynamic aspect that characterizes it, so because of the peculiarity to be adapted to the "time and place" of progress of the teaching activity.

As noted, the questionnaire involves the teacher in reflective and self- evaluation processes referred to the just ended class, in order to inform him about the possible reasons of

[38] R. Kane, S. Sandrotto, C. Heath, *An investigation into excellent tertiary teaching: Emphasising reflective practice*, Higher Education, 2004, 47(3), pp.283-310.

the "mistakes" which have appeared in the didactical process. In addition, this tool allows guiding the improvement process, through the design of the educational interventions (corrective action) to be implemented right after (next lesson).

The phase Act (the ending part of the plan scheme represented in picture n.1) is represented by an additional component to the scheme Plan, which simply repeats the second part of the latter. In this case the teacher "calls back" the phases (or the phase) which have shown "problems", briefly identifying the causes which generated them and finally defining the corrective actions that he will be implement already in the next lesson (phase ACT). In particular, the Act phase, on the basis of the evidences which are supplied by the evaluation and self-evaluation process, nourishes and sustains the path of the teacher on the path of improvement.

Phase Act does not represent a final and conclusive solution regarding the problems which have emerged in the Check Phase. You need to consider this time as an experimental phase that tends to the solution of the problem, but from which not always the effect you want derives. The teacher acts according to its wealth of experience and competences that is limited to the conditions of place and time in which it operates. In this context, he must look for increasing levels of quality of education through continuous improvement and innovation. At this stage, the watchword is, therefore, always trying new teaching strategies which can represent an effective way to the improvement. Therefore, it is necessary to standardize always those "practices" which have determined a positive effect in terms of the solution to the encountered problems (effective learning) and try the innovation. The standardization is not a point of arrival, but an intermediate step toward a constant quest for quality. Pursuing increasing levels of quality in the implemented processes drives to innovation. Ultimately, the teacher is made aware of the characteristics and limitations of the processes in progress, therefore, of the opportunities for the personal and professional growth which they can pose.

Research method and results

The efficacy of the TEM model has been tested through two different analyses. Initially have been compared the performances of the students attending an accounting course, during which it has been used the TEM model, with the ones of different students attending the same course, but in the previous year when the model has been not used.

After that, it have been compared the performances of the students of the following three years when the same professor continued to use the TEM model. The aim was to test the performance increase of the students, if any, across different years.

In both analyses the evaluation has been done through the T-test.

Referring the first type of analysis (picture n.1) we intend to clarify that it have been compared the intermediate exams (which took place at the end of each of three different modules of the same course) and the final ones of the students who attended the course – both referring the year 2010: 100 over 102 (TEM model) both referring the students of the previous year 2009: 94 over 98 (no TEM Model). It has been not considered the students who withdraw the course

Picture n.1 Valuation of the student's performance – with and without the usage of the TEM model.

Indicator	Students Accounting course - I year 2009 Intermediate exam	Students Accounting course - I year 2009 Final exam	Accounting students – II year 2010 Intermediate exam	Accounting students – II year 2010 Final exam
Observations	98	94	102	100
Positive score rate	54	64	66	79
Mean	21,3	22,1	22,8	24,7
Variance	4.8	3.2	3.6	2.7
T-statistic	2.35			
One–tailed p-value	0.0122			

It has been submitted to the students of both courses objective tests during and at the end of each course and it has been decided in advance the score to be assigned to each item of the test. In particular, the tests of the two final exams included the same exercises with the only difference of a set of questions – very similar to the others but not equal (5%) - which still were focused on the same topics. Nobody of the "TEM students" saw the final exams of the previous year – they have been not given back to the students – and nobody know that it should have been submitted the same final exam. This allowed to get an easier and more meaningful comparison to test the following hypotheses:

The group of the students to whom it has been used the TEM model did not get a positive score in the intermediate exams compared to the group of students of the previous year (during the one the TEM model has been not used);

The group of the students to whom it has been used the TEM model did not get an higher average score compared to the one got by the students of the previous year when making the intermediate exams;

The group of the students to whom it has been used the TEM did not get a positive score in the final exam compared to the group of students of the previous year;

The group of the students to whom it has been used the TEM model did not get an higher average score compared to the one got by the students of the previous year when making the final exams;

To test the first hypothesis it has been compared the scores of the intermediate exams done by 98 students during the year 2009 (no TEM model) with the ones of 102 students of year 2010 (TEM model). From the comparison it results that the percentage of the positive scores of the students of year 2010 is higher (66) than the one of the students of the previous year (54). Therefore we can clearly establish that the first hypothesis is false. In particular we want to highlight that the efficacy of the TEM model is due to the fact that it is a model very focused on the students both at the individual level than at classroom level. Definitively, the TEM methodology allows the professor to verify on a permanent basis (at the end of each and/or more lessons) the level of the understanding of the students and put in place immediate corrective actions (Act phase) both at individual level and collective one. Just making an example we would highlight that the most efficacy corrective actions have been realized through very small workgroups to whom it have been assigned exercises related to the objectives not achieved together with role playing at the individual and collective level to increase the motivational level. Consistent improvements took place in a very short time (few lessons). These achievements are part of a continuous improvement process which leads each lesson ongoing towards increasing levels of understanding.

To test the second hypothesis it have been compared the scores of the intermediate exams of the 98 students of the year 2009 with the ones of the 102 students of the year 2010

(TEM model). From the comparison it results that in average the students TEM model got scores higher (22,8) than the ones of the previous year (21,3). Additionally we would highlight that the variance and/or standard deviation in the year 2010 is lower compared to previous year (ref. picture. 1). Therefore also in this case we could state that the Hypothesis n. 2 is false. The variance allows us to highlight what described above. In particular the Deming Cycle, on which the TEM model is based on, forces the professor to assess on a permanent basis the understanding of the students together with a self-assessment (to look for causes of potential problems) and the definition of the corrective actions to implement in the following lessons (to the one that shows the problems. This is the right approach that allows the professor to test new teaching strategies with the aim to enhance the level of understanding of the whole classroom. The corrective actions can be immediately tested in the same lesson during which they have been implemented thanks to the new phase so called "check".

In the course where it has been adopted the TEM model (2010), as already highlighted before, it have been used teaching strategies which follow problems came up during the previous lessons. The PDCA methodology, on which the TEM model is based on, allowed to focus on the student, both as individual and as classroom, and on this direction work for a continuous improvement of the learning capabilities of each ones. It is the pursue of this goal, with an approach based on the quality, which determine a results even more homogeneous in term of learning, highlighted in this case by the variance.

To test the hypothesis n.3 have been compared the same years (2009 - 2010) with the following results: 94 (over 98) students of the year 2009, the positive score of the exams has been lower (64) compared to the scores got by 100 (over 102) students of the year 2010 (79). This analysis allows us to verify, also in this case, the hypothesis n. 3.

It is very useful to underline that the proposed methodology generate an enhancement not only in the professor in terms of better teaching activity but also in the student which become even more confident of the improvements he/she achieve during the time and more responsible of his/her learning. In the final exam this aspect becomes even more evident. The number of students which has past the final exam is higher in the TEM course due to involvement and additional stimulation they receive getting part to a course like this one.

At the end, concerning the hypothesis n. 4, it has been noticed that the average of the scores obtained by the same student of the year 2009 have been significantly lower (22,1) than the ones obtained by the students of the followed year (24,7). Additionally the analysis performed shows a variance in the year 2010 (TEM model) significantly lower than the one of the previous year (Picture 1).

In summary, picture n. 1, shows in the first column the parameters used to perform the analysis of the data related to scores registered from the intermediate and final exams of the accounting course. As can be noticed, the "mean" referred to the student in which the TEM model has been used is higher than the one where the model has been not used ($P<0.05$). The positive results obtained by the students of the TEM course are mainly due, as already mentioned, to the planning activity, control and continuous improvement which the model demands to the professor and which lead towards a constant reference to the learning process generated in the students across the years.

Results even more evident can be achieved across the years through a constant implementation of the model. The background of collected information, which are retained systematically thanks to the model, in addition to the increased experiences gained, allows the professor to make significantly improvements, as clearly shown in picture n. 2.

Picture n. 2 Performance assessment of the student across different years – the TEM model.

Indicator	Students Accounting course 2010	Students Accounting course 2011	Students Accounting course 2012	Students Accounting course 2013
Observations	100	111	104	107
Positive score rate	79	83	91	104
Mean	24.7	26,2	27,1	27,9
Variance	2.7	2.2	2,3	1.5
T-statistic	2.19			
One–tailed p-value	0.0118			

The picture shows the positive results got by the professor across the years applying the TEM model. In particular, if the increasing trend registered across the years highlights positive performances of the students, the variance allows us to test even more the reliability of the model used because it highlights a lower casualness of the scores got by each student. In detail the picture shows as the learning of the students increased constantly across the year getting to the highest level during the last year of the analysis (2013). The background of knowledge and experience which the accounting teacher gained across the time, thanks to the constant usage of the TEM model, has changed the teaching culture of the professor itself allowing him/her to act in a way even more efficacy and efficient. We noticed already how the model generates also in the students a great cultural change in term of increased confidence and responsibility concerning their own learning route, thanks to the continuous process of involvement, stimulation and motivation putted in place by the professor. The most important aspect we would to highlight from the last analysis performed is not only the constant increase of the learning across the time, but also the continuous improvements of the learning consistent of the whole classroom where the model was applied. The teaching strategies experimented and standardized by the teacher across the time (PDCA), have been improved and selected in relation to specific case, recurring individual and collective situations, defining a specific efficiency and efficacy of the teacher in adopting them (p-value 0,0118). In this case the teacher has been always the same, however we want to highlight how, not taking into consideration the specific teaching style which is typical and sometimes very different from people to people, the TEM model leads toward a depth cultural change of the same teacher generating consequently great and positive effects on the learning process.

Other possible causes for improved performance

Other potential cause of the student performance improvements may results to be not really linked to the usage of the TEM model explaining at the same time the results achieved. The most important cause could be that the students to whom the TEM model has been applied were “better performing students” compared with the average of the students of the year 2009 (no TEM model).

Another potential explanation of the really positive results gained by the students could be due to the subjectivity of the teacher during the assessment process.

Concerning the first potential cause we submitted to the students, at the begin of each course, a test having the aim to understand the knowledge of each people and from which a very interesting results came up. In particular during the year 2009 the level of knowledge was higher than the one of year 2010 (when the TEM model has been used). This clearly demonstrates that the positive results obtained by the students through the usage of the TEM model are not impacted by a potential higher performance capacity of each individual.

Concerning the potential influence of the subjectivity of the teacher and in order to avoid it has been submitted to the students objective tests, both at the intermediate and final stage, with pre-defined scores which allow different professors to get to the same assessment. At the end we want to clarify that the assessment of the intermediate exams has been performed by a different accounting professor.

Limitation suggestion and summary

It is not possible to observe a phenomenon as complex as the teaching one with the illusion of having grasped its entirety. The didactical action in its context and temporal constraints assume a dimension that is difficult to observe without the risk of analyzing a less extensive and complex phenomenon than the real one. Although the model allows to observe and evaluate the learning process with respect referring to several variables which condition it, it is difficult to "reduce" to a scheme, although dynamic, an articulated and complex system as the teaching one. The ability to observe and evaluate the teaching path itself, related to the achieved results (learning of learners) and to the way they were achieved (teaching strategies) - during and at the end of the route itself (comparison in time and space) - and to act for the purpose of the improvement can be a sufficient motivation for the "simplification of complexity."

The focus on the teacher, besides, although it represents a strategic point of view of the course in progress - for the mentioned several times reasons - affect the subjectivity of the evaluation process. By contrast the teaching evaluation that was made by the learners meets much more evident limits and is not free of subjectivity. Although the subjectivity is unavoidable, the comparison in time and space that the model allows compared with that what was expressed by the teacher himself and / or other teachers can be a valuable tool for reflection on possible not detected problems or not considered in the most appropriate way. A further aspect of critical issues in the use of the model is the risk of an initial involvement (by the teacher) and a subsequent abandonment that can arise as a result of constant effort that is required to the teacher in the design and evaluation of every educational intervention. Ultimately, what you ask the teacher is a "cultural revolution", a renewal in the way of thinking and managing the educational process that leads the teacher to "be questioned" in each lesson. This determines a consequent professional enrichment, which is decisive for an effective learning process. The utility in choosing this work methodology is also present at the time of a teaching replacement of the teacher. The model "draws" a compulsory path towards the improvement that ensures unity of direction and methodological approach to the course in progress.

Consider, also, how the background of knowledge and experiences which are formalized in comparable standard models is an archive of knowledge that is useful for the universities in order to understand more clearly the educational carried out activities, the produced results and the achieved improvements, so the quality level of the training offer.

At the end we may consider the TEM model as an opportunity for a single academic course, for a specific Department or for the whole University to strive for an increasing level of teaching quality released through the usage of a shared work methodology, mainly focused on the continuous improvement and knowledge sharing.

Looking to the future development of the current research we may disclose you that an additional study about the results generated by the usage of the TEM model in all courses of a Master degree program in accounting is currently in progress. The aim is to compare the performance of the students across three different years during when the TEM model has been used with the one of the previous years when the model was not applied.

References:

Airasian P.W. & Gullickson A. (1997). Theacher self evaluation. In J.H. Stronge (Ed.), Evaluating teaching: A guide for current thinking and best practice (pp.215-247).Thousand Oaks, CA: Corwin Press.

Aleamoni L.M., Student rating miths versus research facts from 1924 to 1998, Journal of Personnel Evaluation in Education, 13 (2): 153-166.

Angelo T.A. e K.P. Cross, Classroom assessment tecniques: a a handbook for college teachers, Jossey-Bass, San Francisco, 1993.

Arreola R.A., Developing a comprehensive faculty evaluation system, Anker Publishing Company, Bolton, MA, 2000.

Beijaard D., P.C.Meeijer, N.Verloop, Reconsidering research on teachers' professional identity, Teaching and Teacher Education, 2004, 20 (2), pp.107-128.

Carpenter B., G.Tait, The rhetoric and reality of good teaching: A case study across three faculties at the Queensland university of Technology, Higher Education, 42(2): 191-203.

Casey R.J., P.Gentile, S.W.Bigger, Teaching appraisal in higher education: An australian perspective, Higher education, 34 (4): 459-482.

Castoldi M., Valutare la qualità dell'insegnamento: problemi concettuali, in C.Coggi, "Per migliorare la didattica universitaria, Pensa Multimedia, Lecce, 2005, p.92.

Cooper K., M.R.Olson, The Multiple I's of teacher identity, in M.Kompf, W.R.Bond, D.Dworet, R.T.Boak, (a cura di), Changing research and proctice: Teachers Professionalism, identities and knowledge, The Falmer Press, London/Woashington, D.C., 1996.

Entwistle N., H.Tait, "Approaches to learning, evaluation of teaching, and preferences for contrasting academic anvironments", Higher Education, 19,1990, pp.169-194.

Entwistle N., H.Tait, Approches to learning, evaluation of teaching, and preferences for contrasting academic environments, Higher Education, 19, 1990.

Entwistle N., P.Ramsden, Understanding Student Learning, London, Croom Helm, 1983.

Feldeman K.A., The perceveid Instructional Effectiveness of College Teachers as related to their Personality and Attitudional Caracteristic: A rewiew and synthesis", Reserch in Higher Education, 24, 1986, pp.139-213.

Feldman K.A., The perceived Instructional Effectiveness of College Teachers as related to their Personality nad Attitudinal Characteristic : A review and syntesis, Research in Higher Education, 24, 1986.

Gow L., D.Kember, "Conceptions of teaching and their relationship to student learning" in British Journal of Educational Psychology, 63, 1996, pp.20-33.

Ho A., D.Watkins, M.Kelly, The conceptual change approch to improving teaching and learning: An evaluation of a Hong Kong staff development programme, Higher Education, 42(2):143-169, 2001.

Kane R., S.Sandrotto e C.Heath, An investigation into excellent tertiary teaching: Emphasising reflective practice, Higher Education, 47, (3):283-310.

Kane R., S.Sandrotto,C.Heath, An investigation into excellent tertiary teaching: Emphasising reflective practice, Higher Education, 2004.

Kember D., K.P.Kwan, Lecturers' approaches to teaching nad their relationship to conceptions of good teaching, Instructional Science, 28 (5): 469-490, 2002.

Kyriakides,L., & Campell.R.J.(2004) School self evaluation and school improvement: A critique of values and procedures. Studies In Educational Evaluation, 30(1), 23-36.

Lejk M., M.Wyvil, Peer assessment of contributions to a group project: Student attitudes to holistic and category-based approaches, Assessment and Evaluation, Higher Education, Falmer Press, London, 2002.

Lueddeke G.R., "Profesionalising Teaching Practice in Higher Education: a study of disciplinary variation and teaching-scholarship", Studies in Higher Education, 28, 2, 2003, pp.213-228.
Lyons N., With portfolio in hand. Validating the new teacher professionalism, Teachers College Press, New York, 1998.
MacBeath J.(1999). Schools must speak for themselves. The case for school self evaluation. London: Routledge.
Marton F., R.Saljo, On qualitative differences, outcomes and process, British Jornal of Educational Psycology, 46,1976, pp.4-11.
Nevo D.(1995). School-based evaluation: A dialogue for school improvement. Oxford: Pergamon.
Peelo M., T.Wareham, Failing students in higher education, Buckingam (and Philadelphia), Open University Press, 2002.
Pozo-Munoz C., E.Rebelloso-Pacheco, B.Fernandez-Ramirez, The ideal teacher. Implications for student evaluation of teacher effectiveness, Assessment and Evaluation in Higher education, 25(3): 253-263, 2000.
Prosser M., P.Ramsden, K.Trigwell, E.Martin, "Dissonance in Esperience of teaching and its Relation to the Quality 2003 of Student Learning", Studies in Higher Education, 28,1,2003, pp.37-48.
Ramsden P.(ed), Improwing learning: New Perspective, London, Kogan Page, 1988.
Ramsden P., Learning to Teach in higher education, London and New York, Routledge, 1992.
Roche L., H.W. Marsh, Multiple dimensions of university teacher self-concept. Construct validation and the influence of students'evaluations of teaching, Instructional Science, 28(5): 439-468.
Romainville M., E.Boxus, La qualité en pédagogie universitarie, in D.Leclercq (ed), Pour une Pédagogie universitarie de qualité, Sprimont (Belgique), Mardaga, 1998.
Samuelovicz K., J.Bain, "Conceptions of teaching held by academic teachers", Higher Education, 24, 1992, pp.93-111.
Samuelowicz K., J.bain, Conceptions of teaching held by academic teachers", Higher Education, 24, 1992, pp.93-111.
Saroyan A. e C. Amundsen, Evaluating university teaching: Time to take stoke, Assessment and Evaluation in Higher Education, 2001.
Scriven M., Student ratings offer useful imput to teacher evaluation, Practical Assessment, Research and Evaluation, 4(7), 1995.
Selding P. and associates, Changing practices in evaluating teaching, Anker Publishing Company, Bolton, MA, 1999(I);
Selding P., and Associates, Changing practices in evaluating teaching, Anker Publishing Company, Bolton, MA, 1999, pp.97-115.
Stephenson J., Capability and quality in higer education, in J.Stephenson, S.Weil (eds), Quality in Learning, London, Kogan Page, 1992.
Stronge J.H., & Ostrander L. (1997). Client surveys in teacher evaluation. In J.H. Stronge(Ed.), Evaluating Teaching: A guide for current thinking and best practice (pp.129-161).Thousand Oaks, CA: Corwin Press.
Trigwell K., E.Martin, "Dissonance in Experience of Teaching and its Relation to the Quality of Student Learning", Studies in Higher Education, 28,1, 2003, p.39.
Trigwell K., et al, "Qualitative differences in approaches to teaching first year university science", Higher Edeation, 27, 1994, pp.75-84.
Van Erbst B., H.Paterson, A.Langworthy, B.Costelo, M.Jones "Of Boxes and bridges. A quality experiencei the interface of higher education and the workplace", Assessment & Evaluation, 26,5,2001, pp.437-448.

VanPetegem P.(2005), Vorm geven aan schoolbeleid (2e herwerkte editie) [Shaping school policy (2nd revised edition)]. Leuven: Acco.
Verna I., Il ciclo di Deming nella didattica universitaria Il Teaching Evaluation Model (TEM), Aracne Editrice, Roma, 2012.
Verna I., Lucianetti L., Continuous improvement in the university teaching: the TEM model Paper accettato al Convegno Internazionale ISF, "International Scientific Forum, Tirana, Albania, 12-14 Dicembre 2013.
Zubizarreta J., Evaluating teaching through portfolio, in P.Selding and Associates, Changing practices in evaluating teaching, Anker Publishing Company, Bolton, MA, 1999, pp.163-182.